

-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and

-- with a support means for holding the flow vessel; and

- a measuring arrangement responsive to the displacement motions performed by the flow vessel,

-- with a pressure sensor sensing a static pressure in the fluid and providing a sensor signal representative of the displacement motions, and

-- with evaluation electronics for the sensor signal.

2. (Amended) The apparatus as claimed in claim 1, wherein the evaluation electronics are operable to derive from the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.

3. (Amended) The apparatus as claimed in claim 1, wherein the evaluation electronics are operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.

4. (Amended) The apparatus as claimed in claim 1, wherein the evaluation electronics are operable to derive from the sensor signal a volume estimate representative of a totalized volume of fluid delivered.

5. (Amended) The apparatus as claimed in claim 1, wherein the evaluation electronics are operable to derive from the sensor signal a status signal representative of a current operational status of the displacement pump.

6. (Amended) The apparatus as claimed in claim 1, wherein the evaluation electronics are operable to derive from the sensor signal a second measurement signal

representative of a suction head of the apparatus.

7. (Amended) The apparatus as claimed in claim 1, wherein the pump drive is a rotary pump drive.

8. (Amended) The apparatus as claimed in claim 1, wherein the pump drive is a linear pump drive.

9. (Amended) A sampler for taking samples of a fluid, said sampler comprising an apparatus for generating a fluid flow, said apparatus comprising:

- a displacement pump
- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,
- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and
- with a support means for holding the flow vessel; and
- a measuring arrangement responsive to the displacement motions performed by the flow vessel,
- with a pressure sensor sensing a static pressure in the fluid and providing a sensor signal representative of the displacement motions, and
- with evaluation electronics for the sensor signal.

10. (Amended) The sampler as claimed in claim 9, wherein the evaluation electronics are operable to derive from the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.

11. (Amended) The sampler as claimed in claim 9, wherein the evaluation

electronics are operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.

12. (Amended) The sampler as claimed in claim 9, wherein the evaluation electronics are operable to derive from the sensor signal a volume estimate representative of a totalized volume of fluid delivered.

13. (Amended) The sampler as claimed in claim 9, wherein the evaluation electronics are operable to derive from the sensor signal a status signal representative of a current operational status of the displacement pump.

14. (Amended) The sampler as claimed in claim 9, wherein the evaluation electronics are operable to derive from the sensor signal a second measurement signal representative of a suction head of the apparatus.

15. (Amended) The sampler as claimed in claim 9, wherein the pump drive is a rotary pump drive.

16. (Amended) The sampler as claimed in claim 9, wherein the pump drive is a linear pump drive.

17. (Amended) The sampler as claimed in claim 9, wherein said sampler is a mobile sampler.

18. (Amended) The sampler as claimed in claim 9, wherein said sampler is a portable sampler.

19. (Amended) The apparatus for generating a fluid flow, said apparatus comprising:

- a displacement pump

-- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and

-- with a support means for holding the flow vessel, wherein the flow vessel is compressed by the pump drive in operation temporarily and in sections and forced against the support means such that the support means is elastically strained; and

- a measuring arrangement responsive to the displacement motions performed by the flow vessel,

-- with a strain sensor sensing a strain of the support means and providing a sensor signal representative of the displacement motions performed by the flow vessel, and

-- with evaluation electronics for the sensor signal.

20. (Amended) The apparatus as claimed in claim 19, wherein the evaluation electronics are operable to derive from the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.

21. (Amended) The apparatus as claimed in claim 19, wherein the evaluation electronics are operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.

22. (Amended) The apparatus as claimed in claim 19, wherein the evaluation electronics are operable to derive from the sensor signal a volume estimate representative of a totalized volume of fluid delivered.

23. (Amended) The apparatus as claimed in claim 19, wherein the evaluation

electronics are operable to derive from the sensor signal a status signal representative of a current operational status of the displacement pump.

24. (Amended) The apparatus as claimed in claim 19, wherein the pump drive is a rotary pump drive.

25. (Amended) The apparatus as claimed in claim 19, wherein the pump drive is a linear pump drive.

26. (Amended) A sampler for taking samples of a fluid, said sampler comprising an apparatus for generating a fluid flow, said apparatus comprising:

- a displacement pump
- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,
- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and
- with a support means for holding the flow vessel, wherein the flow vessel is compressed by the pump drive in operation temporarily and in sections and forced against the support means such that the support means is elastically strained; and
- a measuring arrangement responsive to the displacement motions performed by the flow vessel,
- with a strain sensor sensing a strain of the support means and providing a sensor signal representative of the displacement motions performed by the flow vessel, and
- with evaluation electronics for the sensor signal.

27. (Amended) The sampler as claimed in claim 26, wherein the evaluation

electronics are operable to derive from the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.

28. (Amended) The sampler as claimed in claim 26, wherein the evaluation electronics are operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.

29. (Amended) The sampler as claimed in claim 26, wherein the evaluation electronics are operable to derive from the sensor signal a volume estimate representative of a totaled volume of fluid delivered.

30. (Amended) The sampler as claimed in claim 26, wherein the evaluation electronics are operable to derive from the sensor signal a status signal representative of a current operational status of the displacement pump.

31. (Amended) The sampler as claimed in claim 26, wherein the pump drive is a rotary pump drive.

32. (Amended) The sampler as claimed in claim 26, wherein the pump drive is a linear pump drive.

33. (Amended) The sampler as claimed in claim 26, wherein said sampler is a mobile sampler.

34. (Amended) The sampler as claimed in claim 26, wherein said sampler is a portable sampler.

35. (Amended) A method of monitoring an apparatus serving to generate a fluid flow, the apparatus comprising: a displacement pump, with at least one flow vessel of deformable lumen, which serves to conduct a fluid, with a pump drive for producing displacement motions of

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the flow vessel which deform the lumen and cause the fluid flow, with a drive motor for the pump drive, and with a support means for holding the flow vessel; and a measuring arrangement responsive to the displacement motions of the flow vessel and comprising a pressure sensor for sensing a static pressure in the fluid, said method comprising the steps of:

- causing displacement motions of the flow vessel for taking a fluid;
- sensing the pressure and generating a sensor signal representative of said

displacement motions; and

- deriving from the sensor signal a status signal signaling a current operational status of the apparatus.

36. (Amended) A method of monitoring a sampler with an apparatus serving to generate a fluid flow, the apparatus comprising: a displacement pump, with at least one flow vessel of deformable lumen, which serves to conduct a fluid, with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, with a drive motor for the pump drive, and with a support means for holding the flow vessel; and a measuring arrangement responsive to the displacement motions of the flow vessel and comprising a pressure sensor sensing a static pressure in the fluid, said method comprising the steps of:

- causing displacement motions of the flow vessel for taking the fluid;
- sensing the pressure and generating a sensor signal representative of said

displacement motions; and

- deriving from the sensor signal a status signal signaling a current operational status of said sampler to be monitored.

Please add the following new claims: /

37. (New) An apparatus for generating a fluid flow, said apparatus comprising:

a displacement pump

with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and

with a support means for holding the flow vessel, wherein the flow vessel is compressed by the pump drive in operation temporarily and in sections and forced against the support means such that the support means is elastically deformed; and

a measuring arrangement responsive to the displacement motions performed by the flow vessel,

with a sensor sensing a deformation of the support means and providing a sensor signal representative of the displacement motions performed by the flow vessel, and

with evaluation electronics for the sensor signal.

38. (New) A method of monitoring an apparatus according to claim 37, said method comprising the steps of:

causing displacement motions of the flow vessel;

sensing a deformation of the support means and generating a sensor signal representative of said displacement motions; and

deriving from the sensor signal a status signal signaling a current operational status of the apparatus.



39. (New) The method as claimed in claim 38, wherein the step of sensing a deformation of the support means comprises a step of sensing a strain of said support means.

40. (New) An apparatus for generating a fluid flow, said apparatus comprising:  
a displacement pump

with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and

with a support means for holding the flow vessel; and

a measuring arrangement responsive to the displacement motions performed by the flow vessel,

with a pressure sensor sensing an instantaneous pressure in the fluid and providing a sensor signal representative of the displacement motions, and with evaluation electronics for the sensor signal.

41. (New) The apparatus as claimed in claim 40, wherein the pressure sensor contacts fluid within said flow vessel.

42. (New) The apparatus as claimed in claim 40, wherein the pressure sensor senses said static pressure in the fluid relative to a pressure acting on said flow vessel from outside.

43. (New) The apparatus as claimed in claim 1, wherein the pressure sensor contacts fluid within said flow vessel.

44. (New) The apparatus as claimed in claim 1, wherein the pressure sensor senses